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EPSILON ASSOCIATES INC.
Engineers ■ Environmental Consultants

February 20, 2003 Ref. No. 69401

Mr. Ron Peabody
Northwest Development
178 Great Road
Acton, MA 01720-5711

Re: Palmer Kennels, Skyline Drive – Acton, MA
Sound Level Review

Dear Ron:

Epsilon Associates, Inc. is pleased to provide this sound level review for a proposed dog kennel relocation in Acton, Massachusetts. Palmer Kennels will be relocated within the site of the Quail Ridge Country Club located on Skyline Drive off Great Road (Route 2A). Palmer Kennels is currently operating at the site and has been in this location for over 50 years. The focus of this review will be an examination of the materials proposed for use in the new kennel as compared to the existing kennel, as well as the distances from the kennel to the nearest residential locations.

Existing Conditions

The nearest residential locations to the existing kennels are the Brook Run condominiums on Route 2A, and the Crestfield Condominiums on Route 27 near the intersection of Route 2A. The distance from the existing kennels to the closest and farthest condominium unit in each complex are summarized below. The closest Brook Run unit is more than twice as close as the nearest Crestfield unit.

Residential Location	Closest Unit	Farthest Unit
Brook Run condos	700 feet	1400 feet
Crestfield condos	1500 feet	1900 feet

The kennels currently consist of an uncovered (no roof) outside run for each dog. Access to the outside run is through an uninsulated metal door fitted with a smaller "doggie door." The interior pen for each dog is made of uninsulated 8-inch concrete block with R-19 insulated ceilings.

Future Conditions

The nearest residential locations to the future kennels will still be the Brook Run condominiums and the Crestfield Condominiums. The distance from the future kennels to the closest and farthest condominium unit in each complex are summarized below.

Residential Location	Closest Unit	Farthest Unit
Brook Run condos	1000 feet	1900 feet
Crestfield condos	1000 feet	1300 feet

The effect of the change in distance, all other factors being equal, is to decrease sound levels from the kennels at Brook Run by approximately 3 A-weighted decibels (dBA), while sound levels at the Crestfield condos would increase approximately 3 dBA.

The future kennels will have a roof over the outside run for each dog. The roof system will consist of Robertson Dura-Rib 26-gauge steel panels with 3-inch thick Gymguard faced blanket insulation fastened directly to the interior of the roofing panels as a moisture and sound barrier. The insulation panels will be an effective absorber of sound energy as demonstrated by a Noise Reduction Coefficient (NRC) of 0.70. Technical specification sheets for the roofing system are attached to this letter. Although it is not possible to quantify exactly how many decibels the sound levels will decrease through the construction of this roof system, it is certain that it will reduce sound levels versus the current open configuration.

Access to the outside run will be through a 1.5-inch thick insulated aluminum door fitted with a smaller "doggie door." The interior pen for each dog is made of 8-inch concrete block filled with insulation to reduce noise, and the ceilings will be R-30 batt insulation. The interior space will be conventional stick construction plus a covering of polymax 0.25-inch sheeting for protection from the dogs.

Conclusions

The building materials proposed for the reconstructed dog kennel represent good management practice to reduce both interior and exterior noise. In all cases, they have equal or greater sound level reduction properties than the kennels as currently built. In addition, whenever practical, the west-side kennels may be occupied first leaving the eastside kennels (facing the residential areas) for use only during the periods of peak activity. As a result of the kennel relocation, the distance from the kennel to the closest residence will increase from 700 feet to 1000 feet, an immediate decrease of 3 decibels. It is recommended that a 6-foot high wooden fence be constructed along the kennels facing the Crestfield Condominiums and Route 2A. With all these measures in place, the noise from the relocated kennels will be less of an impact to the nearest residents than it is today.

Qualifications

I have 16 years experience in the area of community noise impact assessments. During this time I have performed over 400 noise studies. A copy of my resume is attached.

If you have any questions on this review, please feel free to call me at (978) 461-6236.

Very truly yours,

EPSILON ASSOCIATES, Inc.

Robert D. O'Neal

Robert D. O'Neal, CCM
Senior Consultant

LAMTEC®
CORPORATION

Insulation for exterior roofing panels at kennel

ACOUSTICAL PERFORMANCE

Facing Type		GYMGUARD		ARENASHIELD	
Insulation R-Value		R-10	R-19	R-10	R-19
Insulation Thickness (approx).		3"	6"	3"	6"
Frequency Hz	63 Hz	-0.04	0.28	0.02	0.34
	80 Hz	0.24	0.61	0.23	0.65
	100 Hz	0.39	1.06	0.36	1.10
	125 Hz	0.50	1.13	0.48	1.12
	160 Hz	0.79	1.29	0.80	1.25
	200 Hz	1.01	1.17	0.96	1.15
	250 Hz	1.20	1.11	1.18	1.09
	315 Hz	1.14	0.94	1.16	0.92
	400 Hz	1.05	0.84	1.05	0.81
	500 Hz	0.86	0.71	0.85	0.70
	630 Hz	0.74	0.66	0.70	0.65
	800 Hz	0.57	0.60	0.56	0.57
	1000 Hz	0.43	0.49	0.41	0.48
	1250 Hz	0.35	0.40	0.34	0.39
	1600 Hz	0.30	0.31	0.29	0.30
	2000 Hz	0.25	0.26	0.25	0.26
	2500 Hz	0.21	0.20	0.20	0.20
	3150 Hz	0.17	0.18	0.16	0.17
	4000 Hz	0.15	0.14	0.13	0.14
	5000 Hz	0.10	0.11	0.10	0.11
NRC*		**0.70**	**0.65**	**0.65**	**0.65**

* NRC Calculated at 250, 500, 1000, and 2000 Hz

(PERF) = Perforated

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This page was last updated: January 9, 2001

CINCO LTD. GENERAL CONTRACTORS

Dura-Rib® Roof System

Dura-Rib® roof panel is a proven product that provides durability, cost efficiency & ease in erection.

Dura-Rib® is a 36" wide panel with ribs on 12" centers and a full sidelap configuration. It is available in 24 and 26 gauge steel. The 80, 000 pounds per square inch yield enhances walkability, resistance to hail damage and along with the deep ribbed panel configuration increases load carrying capacity.

The sidelap configuration is engineered to ensure weather tightness. The purlin bearing leg design makes panel alignment and fastener engagement easy and consistent. A quality sealant is applied during erection which helps eliminate water migration and air infiltration.

Special fasteners with innovative pilot points to minimize fastener strip-out are used, and increased fasteners along the eave will combat moisture migration from ice and snow build-up.

Dura-Rib® panels have both UL30 and UL90 classification from Underwriters Laboratories Inc., for wind uplift resistance. These ratings meet the requirements in most provinces and states for reduced insurance coverage rates, thereby resulting in substantial savings on insurance premiums.

Dura-Rib® is available with a long life coating against roof perforations. It is also available with Aluminum-Zinc coating, factory painted with either Ceram-A-Star 950 or 70% Kynar®. The standard colour for Dura-Rib® roof panels is white with other colours available.

When these factors are combined, Dura-rib becomes an uncompromising roof system.

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ROBERT D. O'NEAL, CCM

EPSILON ASSOCIATES, INC.
SENIOR CONSULTANT

EDUCATION

M.S., Atmospheric Science, Colorado State University, 1987
B.A., Engineering Science, Dartmouth College, 1983

REGISTRATIONS

Certified Consulting Meteorologist, #578

PROFESSIONAL SUMMARY

Mr. Robert O'Neal is a Certified Consulting Meteorologist with over 15 years experience in the areas of community noise impact assessments and air quality modeling. Mr. O'Neal's noise impact evaluation experience includes design and implementation of sound level measurement programs for mobile and stationary sources, modeling of future impacts, conceptual mitigation analyses, and compliance testing. He has performed noise measurement and modeling assessments for power generation facilities in the Northeast, Mid-Atlantic region, and Midwest U.S. He has also provided expert witness testimony on noise impact studies and air pollution modeling in front of local boards, courts of law, and adjudicatory hearings. His air quality background involves applying air quality dispersion models for regulatory permitting applications, as well as for general air quality impact evaluations. He has experience with the CALMET/CALPUFF modeling system used to evaluate visibility and acid deposition impacts in Class I areas. Representative industries served include power generation, mining and aggregate handling, asphalt plants, paper mills, real estate development, and mobile sources.

PROFESSIONAL EXPERIENCE

Independent Power Projects

- *Besicorp-Empire Development Company – Rensselaer, NY.* Prepared interrogatory responses, and testimony for the Noise section of the Article X application for this proposed 505 MW combined-cycle gas-fired electric power generation facility, recycled newsprint manufacturing plant, and waste water treatment plant. Additional testimony was provided for Technical Conference hearings before a NYS DEC Administrative Law Judge.

- *Milford Power Co., LLC – Milford, CT.* Conducted post-construction ambient sound level measurements for a 544 MW combined-cycle gas-fired electric generating facility. The project utilizes two Alstom GT-24 combustion turbines, one steam turbine, and an 8-cell wet mechanical cooling tower. High-pressure steam blows and transformer noise were also measured during construction and assessed for community impacts.

- *Confidential Client – New York State.* Preparing the Noise section of the Article X application for this proposed 500 MW combined-cycle gas-fired electric power generation facility. The project will utilize two GE 7FA combustion turbines, one steam turbine, and an air-cooled

condenser. Ambient sound level measurements and noise impact modeling will be performed in support of the Article X application and to show compliance with the local noise ordinance.

- *Sithe Energies – Heritage Station, Oswego, New York.* Conducted ambient sound level measurements and performed sound level modeling at the 1000 MW Independence Station power plant in support of permitting a proposed 800 MW combined-cycle electric generation facility adjacent to the existing station in Oswego. The proposed project will utilize General Electric's new "H" System combustion turbine technology, and a 16-cell wet mechanical cooling tower. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling. Mr. O'Neal prepared the Noise section of the Article X Application in conjunction with the New York State Public Service Law as well as expert testimony on noise for the Article X public hearings.

- *PG&E – Mantua Creek, West Deptford, NJ.* Conducted single-station CALPUFF modeling for impacts at the nearest Class I area for a proposed 800 MW natural gas-fired combined-cycle electric power generation facility. The latest IWAQM Phase 2 guidance was followed for calculating ambient concentration, wet and dry deposition, and regional haze impacts at the Brigantine National Wildlife Refuge.

- *FPL Energy – Bayswater Peaking Facility, Far Rockaway, NY.* Managed the noise impact study as part of an Environmental Assessment for a 55 MW natural gas-fired peaking plant utilizing two P&W combustion turbines. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling.

- *Duke Energy Power Services, LLC – Ohio, Indiana, Illinois, Missouri.* Conducted ambient sound level measurement programs and performed acoustical modeling for six proposed simple-cycle electric power generation facilities in the Midwest for Duke Energy. These 640 MW peaking stations were permitted for 8 GE 7EA combustion gas turbines. The results of the noise impact assessment were used to secure site plan approval from the local community.

- *Calpine Corporation – Ontelaunee Energy Center, Ontelaunee, PA.* Conducted 24-hour ambient sound level measurements at multiple sites for a proposed 543 MW natural gas-fired combined-cycle electric power generation facility utilizing two Westinghouse 501F combustion turbines. A compliance demonstration with the local noise ordinance was done utilizing the ambient background data and acoustical modeling.

- *Brockton Power, LLC – Brockton Power Station, Brockton, MA.* Conducted a 72-hour continuous ambient sound level measurement program at multiple sites for a proposed 270 MW natural gas-fired combined-cycle electric power generation facility. Acoustical modeling, including additional mitigation of the cooling tower, was performed to demonstrate compliance with the State noise regulation.

- *AES Corporation – AES Granite Ridge Energy Facility, Londonderry, NH.* Directed a 14-day continuous ambient sound level measurement program in support of local permitting requirements for a proposed 720 MW natural gas-fired combined-cycle electric power generation facility. The proposed project includes two Westinghouse 501G combustion turbines, two heat recovery steam generators, one steam turbine, and a wet mechanical cooling

tower. Short-term daytime and nighttime sound level measurements were made with and without leaves and insects to characterize the variation in possible ambient sound levels.

- *Reliant Energy – Hope Energy Project, Johnston, RI.* Conducted ambient sound level measurements in support of state and local permitting requirements for a proposed 540 MW natural gas-fired combined-cycle electric power generation facility. The proposed project includes two Westinghouse 501F combustion turbines, two heat recovery steam generators, one steam turbine, and a wet mechanical cooling tower.

- *Vermont Marble Company, Proctor, VT.* Applied the ISC and VALLEY models using five years of refined meteorological data as part of state and PSD permitting for an 8 MW combustion turbine cogeneration project located at a marble processing plant in Vermont.

Linear Siting and Transmission Projects

- *BP/Amoco – Continental Divide EIS, Wyoming and Colorado.* Performed meteorological and air quality dispersion modeling for a proposed natural gas field development project in Wyoming using the CALMET and CALPUFF models. Extensive emission inventories were developed within a large domain (200,000 km^2) using state air agency records and permit file reviews. Ambient pollutant concentrations, wet and dry deposition, and visibility impacts at eight Class I areas from long-range transport were evaluated as a result of the project and the cumulative inventory.

- *New England Power, Dorchester and Quincy, MA.* Prepared a Noise Control Plan for construction activities related to the Dorchester-Quincy 115-kv Cables Project. This project involved ambient background noise monitoring at several residential receptors along the route connecting two electrical substations in Boston and Quincy, Massachusetts, calculation of expected construction noise impacts, a compliance evaluation with city noise regulations, and specification of contingency noise control measures.

- *Iroquois Pipeline Company, NY, NY.* Third Party contractor with the Federal Energy Regulatory Commission (FERC) for preparation of an Environmental Impact Statement for the Eastchester Pipeline Project filed with FERC by Iroquois Gas Transmission System. The project consists of a proposed new 30-mile pipeline from Northport across Long Island Sound into the Bronx, New York and four compressor stations in upstate New York. Responsible for air quality and noise existing conditions and future impact evaluation along various routes.

- *MWRA – MetroWest Tunnel, Loring Road Water Storage Tanks, Weston, MA.* As part of the technical review team on behalf of the local municipality, a review of the noise impacts resulting from a change in the proposed construction techniques of two new water storage tanks (capacity 20 million gallons) was conducted. Results of the analysis were presented in a public hearing before the MetroWest Growth Management Committee.

- *MWRA – Deer Island Sewage Treatment Project, Boston, MA.* Sound level measurements were performed at the fabrication shop for two high-volume mobile blower units to certify that the units met the project acoustical criteria prior to their acceptance for shipment to the site.

- *Algonquin Gas Transmission Company, NY and RI.* A noise analysis in support of a FERC filing was prepared for two existing natural gas compressor stations in Southeast, NY and Burrillville,

RI. In order to increase the horsepower of the existing gas turbine compressors at each station, 24-hour noise measurement data were analyzed to reflect the new turbine ratings, and demonstrate that the change would safely meet FERC noise criteria. The results were written up in a Resource Report 9.

- *Air Products and Chemicals, Inc., Hopkinton, MA.* Developed, coordinated, and executed a staffed 24-hour ambient sound level measurement program at five receptors for a natural gas liquefaction station in support of a FERC application.

Sand & Gravel Operations

- *Dalrymple Gravel & Contracting Co., Inc., Erwin, NY.* A sound level impact analysis was performed for a proposed sand and gravel excavation site ("Scudder Mine") at a site in Steuben County in support of the NYS DEC Mined Land Reclamation Permit and SEQRA process. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at an existing excavation site and were used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a NYS Administrative Law Judge.

- *Newport Sand & Gravel, Goshen, NH.* A sound level impact analysis was performed for a proposed 68-acre sand and gravel excavation site along Route 10 in Goshen. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. The results of this work were presented to the local Zoning Board of Appeals.

- *Granite State Concrete, Inc., Lyndeborough/New Boston/Mont Vernon, NH.* A sound level impact analysis was performed for a proposed 39-acre expansion of an existing sand and gravel excavation site in Lyndeborough. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at the existing excavation site and used to calculate future sound level impacts. The results of this work were presented to the local Zoning Board of Appeals.

- *Palumbo Block Co., Inc., Ancram, NY.* A sound level impact analysis was performed for a proposed sand and gravel excavation site ("Neer Mine") in Columbia County in support of the NYS DEC Mined Land Reclamation Permit process. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a NYS Administrative Law Judge.

- *P.J. Keating Co., Townsend, MA.* A sound level impact analysis was performed for a proposed sand and gravel excavation site. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were measured at existing excavation sites and used to calculate future sound level impacts. The results of this work were presented as expert witness testimony in Massachusetts Land Court in Boston.

Rock Quarries

- *Sour Mountain Realty, Inc., Fishkill, NY.* A sound level impact analysis was performed at the site of a proposed hard rock quarry in support of a NYS DEC Mined Land Reclamation Permit application in Dutchess County. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and processing equipment were measured at existing rock quarries and used to calculate future sound level impacts. Expert testimony on noise impacts was provided before a NYS Administrative Law Judge.

- *Middlesex Materials, Littleton, MA.* Ambient sound level measurements were conducted at residential locations around an existing hard rock quarry to test the effectiveness of various equipment noise reduction measures.

- *A.A. Wills Materials, Inc., Freetown, MA.* Ambient sound level measurements were conducted at residential locations around an existing 105-acre hard rock quarry along Route 140. Four days of continuous measurements were made with and without the quarry operating to determine the impact of the operations on ambient sound levels in the neighborhood.

Asphalt Plants

- *Tilcon Capaldi, Inc., Watertown and Weymouth, MA.* Air quality impacts from two asphalt-batching plants were evaluated based on best management practices and dispersion modeling. Both fugitive sources from materials handling and ducted combustion sources were reviewed and mitigation measures were recommended. Expert testimony was provided on matters before the MA DEP and abutters of the plants.

- *Pike Industries, Inc., Henniker, NH.* Air quality dispersion modeling, control technology evaluation, best management practice review, and meteorological data analysis were conducted for an asphalt batch plant in order to address a local odor issue. The results of this work were presented in meetings with the NH ARD and the neighbors.

- *Pike Industries, Inc., Ossipee and Madison, NH.* Air quality dispersion modeling was conducted for two asphalt batch plants in order to revise the State air pollution permit to allow the burning of specification used oil.

- *P.A. Landers, Inc., Plymouth, MA.* Full permitting was provided for a new 400-ton/hour drum mix asphalt plant. Emissions calculations, a BACT analysis, air quality dispersion modeling, and a full noise impact assessment were conducted for the MA DEP permit. Technical presentations on air quality and noise impacts were made at the local public hearings to obtain site plan approval for the Project.

- *Todesca Equipment Corporation, Boston, MA.* Full permitting was provided for a new drum mix asphalt plant. Emissions calculations, a BACT analysis, air quality dispersion modeling, and a full noise impact assessment were conducted for the MA DEP permit. Air quality and noise impact analyses were provided for the Environmental Impact Reports. Technical presentations on air quality and noise impacts were made at the local public hearings to obtain site plan approval for the Project.

- *Industrial Bituminous Development Corporation, Wrentham, MA.* Full permitting was provided for a new asphalt batch plant. Emissions calculations, a BACT analysis, air quality dispersion modeling, and a full noise impact assessment were conducted for the MA DEP permit.

Industrial/Commercial Projects

- *Environmental Soil Management, Inc., Loudon, NH.* An extensive sound level measurement program was conducted for a thermal soil treatment plant in response to community noise complaints. Simultaneous overnight measurements were made at multiple locations with and without the plant operating to identify the possible sources of area noise. Digital audio tape recordings were collected and presented at the local zoning board meeting to demonstrate the low noise levels. Follow-up measurements were made to satisfy decibel limits imposed by the board in order to allow 24-hour per day operations.

- *Wingra Engineering, Inc., Tennessee.* Performed meteorological and air quality dispersion modeling in support of a multi-site evaluation for a proposed gray and ductile iron foundry project in Tennessee using the CALMET and CALPUFF models. Ambient pollutant concentrations, wet and dry deposition, and visibility impacts at four Class I areas from long-range transport were evaluated as a result of the project and background sources.

- *Resource Recovery of Cape Cod, Sandwich, MA.* Prepared a noise impact and mitigation assessment for an existing 600-ton/day construction & demolition transfer station on Cape Cod. This project involved extensive ambient background noise monitoring at sensitive receptors around the site, calculation of expected operational noise impacts from the processing equipment, a compliance evaluation with State noise regulations, and mitigation calculations.

- *Merrimack Valley Processing Corp., Lowell, MA.* Prepared a noise impact assessment for a proposed 600-ton/day solid waste transfer station in Lowell, MA. This project involved ambient background noise monitoring at sensitive receptors around the site, calculation of expected operational noise impacts from the processing equipment, a compliance evaluation with State and city noise regulations, and expert testimony before the Board of Health during the site assignment hearings.

- *Dartmouth-Hitchcock Medical Center, Lebanon, NH.* As part of the state air quality permitting process, applied the ISC and VALLEY models to demonstrate compliance with the NAAQS for the new construction of a major New England hospital's boilers, incinerator, and diesel generators. Interactive modeling was required within the area of significant impact.

- *Charles River Plaza, Boston, MA.* Ambient sound level measurements and noise modeling were conducted to evaluate the future potential noise impacts from construction and operation of a mixed-use real estate development in an active urban location. Key operational noise sources included the rooftop mechanical equipment, and the forced-air ventilation system supporting the underground parking garage. The results were incorporated in the city and state environmental permitting approval process (Article 80 and MEPA respectively).

- *The Home Depot, Sutton, MA.* Ambient sound level measurements, noise modeling, and air quality modeling were conducted to evaluate the potential noise impacts from the operation of a new 24-hour per day 200-dock regional distribution center. The primary sources included the

delivery trucks and yard dogs. Expert testimony on air quality and noise impacts were presented in Massachusetts Land Court.

- *The Stop & Shop Supermarket Company, Boston, MA.* Noise impacts from loading dock activity, truck traffic, and rooftop mechanical equipment were analyzed as part of the local approval process for a building expansion project at Stop & Shop Supermarket's 500,000 square foot regional distribution center in Boston. Twenty-four hour per day sound level measurements were made of the existing operations at nearby residential locations to assist in identifying mitigation measures. The results of the study were presented to interested abutters in a series of neighborhood meetings.

Transportation Projects

- *Massachusetts Highway Department, I-93/Route 125 Interchange, Wilmington, MA.* Interchange redesign is proposed on I-93 to support an area of developing industrial and commercial land uses. Predictive noise impact modeling was done using the Transportation Noise Model (TNM) for numerous alternative design options to assist in identifying the route with least noise impacts. The results of the modeling were included in the EA/EIR submittals.

- *Amtrak, Boston, MA.* Developed, coordinated, and executed a staffed overnight (8-hour) ambient sound level measurement program to measure rail yard noise from diesel engine switching and idling operations for Amtrak in South Boston.

- *Delaware Department of Transportation, New Castle County, DE.* Performed noise impact assessment and air quality analyses in support of an EIS for the reconstruction of a 15-mile stretch of US Route 301. The noise analyses were done using the latest version of the STAMINA/OPTIMA noise modeling software.

Expert Testimony Experience

- Expert witness before NY DEC Administrative Law Judge for a cogeneration power plant, a hard rock quarry facility, and two sand and gravel excavation sites.

- Expert witness for site assignment hearings on a solid waste transfer station in Lowell, MA.

- Expert witness in Massachusetts Land Court for a proposed sand and gravel pit, and cross-dock distribution center.

- Expert witness for Vermont Act 250 Land Use process for ski areas.

- Expert witness before MA DEP Administrative Law Judge for an asphalt plant.

- Expert witness before municipal boards on issues of air pollution and noise impacts from local industries.

- Invited specialty speaker on noise impact assessments for Boston University's Masters of Urban Planning degree program.

PROFESSIONAL ORGANIZATIONS

American Meteorological Society - Certified Consulting Meteorologist #578
Air and Waste Management Association
Acoustical Society of America

PUBLICATIONS

O'Neal, R.D., 2001: The Impact of Ambient Sound Level Measurements on Power Plant Noise in Massachusetts: A Case Study. Air & Waste Management Association 94th Annual Meeting and Exhibition, Orlando, FL, June 24-28.

Hendrick, E.M., and R.D. O'Neal, 2001: A Case Study of Class I Impacts Using CALPUFF Screen. Air & Waste Management Association Guideline On Air Quality Models: A New Beginning, Newport, RI, April 2001.

Wu, Z.X., J.S. Scire and R.D. O'Neal, 1998: Comparison of One Year of MM5 and CALMET Meteorological Fields with Observations in the Western United States. Presented at the Eighth PSU/NCAR Mesoscale Model Users' Workshop, Boulder, CO, June 1998.

O'Neal, R.D., 1994: Indoor air sampling techniques used to meet workplace and ambient air toxic detection requirements. Air & Waste Management Association 87th Annual Meeting and Exhibition, Cincinnati, OH, June 19-24.

O'Neal, R.D., 1992: Estimating future noise levels from industrial noise sources. Acoustical Society of America 124th Meeting, New Orleans, LA, October 31 - November 4.

O'Neal, R.D., 1991: Predicting potential sound levels: A case study in an urban area. *Journal of the Air & Waste Management Association*, **41**, 1355-1359.

O'Neal, R.D., 1991: Temporal traffic fluctuations and their impact on modeled peak eight-hour carbon monoxide concentrations. Air & Waste Management Association 84th Annual Meeting and Exhibition, Vancouver, B.C., June 16-21.

O'Neal, R.D., 1990: Noise barrier insertion loss: A case study in an urban area. Air & Waste Management Association 83rd Annual Meeting and Exhibition, Pittsburgh, PA, June 24-29.

McKee, T.B. and R.D. O'Neal, 1989: The role of valley geometry and energy budget in the formation of nocturnal valley winds. *Journal of Applied Meteorology*, **28**, 445-456.

O'Neal, R.D. and T.B. McKee, 1987: Draining or pooling mountain valleys: A matter of geometry. *Proceedings of the Fourth Conference on Mountain Meteorology*, Seattle, WA, August 25-28.

PREVIOUS EMPLOYERS

Earth Tech, Inc. 1997-2000
Tech Environmental, Inc. 1987-1997